

KPDES FORM 1

AI 769

KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

2004 SEP 27 P 3:36

PERMIT APPLICATION

This is an application to: (check one)

- ☐ Apply for a new permit.
☒ Apply for reissuance of expiring permit.
☐ Apply for a construction permit.
☐ Modify an existing permit.

Give reason for modification under Item II.A.

A complete application consists of this form and one of the following:

Form A, Form B, Form C, Form F, or Short Form C

For additional information contact:

KPDES Branch (502) 564-3410

no \$ needed

I. FACILITY LOCATION AND CONTACT INFORMATION		AGENCY USE		0	0	2	3	3	8	8
A. Name of business, municipality, company, etc. requesting permit Hopkinsville Water Environment Authority (HWEA)										
B. Facility Name and Location						C. Facility Owner/Mailing Address				
Facility Location Name:						Owner Name:				
Northside Wastewater Treatment Plant						HWEA				
Facility Location Address (i.e. street, road, etc.):						Mailing Street:				
Pisposal Plant Road						P.O. Box 628				
Facility Location City, State, Zip Code:						Mailing City, State, Zip Code:				
Hopkinsville, Kentucky 42240						Hopkinsville, Kentucky 42241				
						Telephone Number: (270) 887-4240				

II. FACILITY DESCRIPTION			
A. Provide a brief description of activities, products, etc: Wastewater Treatment Plant			
B. Standard Industrial Classification (SIC) Code and Description			
Principal SIC Code & Description:			
Other SIC Codes:			

III. FACILITY LOCATION	
A. Attach a U.S. Geological Survey 7 1/2 minute quadrangle map for the site. (See instructions)	
B. County where facility is located: Christian	City where facility is located (if applicable): Hopkinsville
C. Body of water receiving discharge: North Fork of Little River	
D. Facility Site Latitude (degrees, minutes, seconds): 36 degrees, 52 minutes, 14 seconds	Facility Site Longitude (degrees, minutes, seconds): 87 degrees, 30 minutes, 30 seconds
E. Method used to obtain latitude & longitude (see instructions): Topo Map Coordinates	
F. Facility Dun and Bradstreet Number (DUNS #) (if applicable):	

IV. OWNER/OPERATOR INFORMATION**A. Type of Ownership:**
☒ Publicly Owned ☐ Privately Owned ☐ State Owned ☐ Both Public and Private Owned ☐ Federally owned
B. Operator Contact Information (See instructions)

Name of Treatment Plant Operator:

Joe Finchum

Telephone Number:

(270) 887-4298

Operator Mailing Address (Street):

P.O. Box 628

Operator Mailing Address (City, State, Zip Code):

Hopkinsville, Kentucky 42240

Is the operator also the owner?

Yes ☐ No ☒

Is the operator certified? If yes, list certification class and number below.

Yes ☒ No ☐

Certification Class:

III

Certification Number:

8388

V. EXISTING ENVIRONMENTAL PERMITS

Current NPDES Number:

KY0023388

Issue Date of Current Permit:

06/01/2000

Expiration Date of Current Permit:

12/31/2004

Number of Times Permit Reissued:

Date of Original Permit Issuance:

Nov 1937

Sludge Disposal Permit Number:

Kentucky DOW Operational Permit #:

Kentucky DSMRE Permit Number(s):

C. Which of the following additional environmental permit/registration categories will also apply to this facility?

CATEGORY	EXISTING PERMIT WITH NO.	PERMIT NEEDED WITH PLANNED APPLICATION DATE
Air Emission Source		
Solid or Special Waste		
Hazardous Waste - Registration or Permit		

VI. DISCHARGE MONITORING REPORTS (DMRs)

KPDES permit holders are required to submit DMRs to the Division of Water on a regular schedule (as defined by the KPDES permit). The information in this section serves to specifically identify the department, office or individual you designate as responsible for submitting DMR forms to the Division of Water.

A. Name of department, office or official submitting DMRs:

Len F. Hale, General Manager

B. Address where DMR forms are to be sent. (Complete only if address is different from mailing address in Section I.)

DMR Mailing Name:

Hopkinsville Water Environment Authority

DMR Mailing Street:

P.O. Box 628

DMR Mailing City, State, Zip Code:

Hopkinsville, Kentucky 42241

DMR Official Telephone Number:

(270) 887-4147

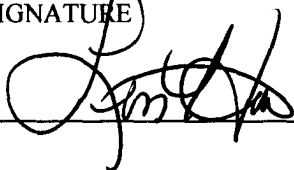
VII. APPLICATION FILING FEE

KPDES regulations require that a permit applicant pay an application filing fee equal to twenty percent of the permit base fee. Please examine the base and filing fees listed below and in the Form 1 instructions and enclose a check payable to "Kentucky State Treasurer" for the appropriate amount. Descriptions of the base fee amounts are given in the "General Instructions."

Facility Fee Category:	Filing Fee Enclosed:
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VIII. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

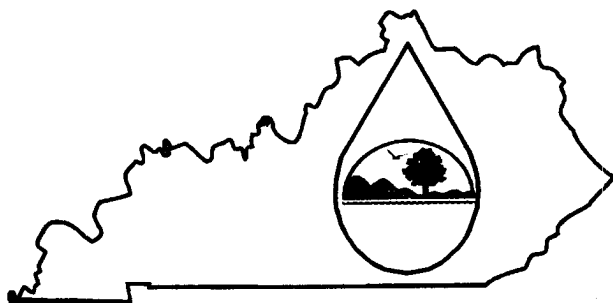
NAME AND OFFICIAL TITLE (type or print):	TELEPHONE NUMBER (area code and number):
Len F. Hale, General Manager	(270) 887-4240
SIGNATURE 	DATE: September 21, 2004

KPDES FORM A

KENTUCKY POLLUTANT DISCHARGE RECEIVED BY KPDES BRANCH ELIMINATION SYSTEM

2004 SEP 27 P 3: 36

PERMIT APPLICATION



A complete application consists of this form and Form 1.
For additional information, contact KPDES Branch (502) 564-3410.

I. FACILITY DESCRIPTION	AGENCY USE							
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A. Name of Facility Where Discharge Will Occur: Northside Wastewater Treatment Plant	Owner of Facility: HWEA
Location - Number and Street or Other Identifier: Disposal Plant Road	County: Christian
City: Hopkinsville	

B. Indicate if part of your discharge is into a municipal waste transport system under another responsible organization. Yes <input type="checkbox"/> (Continue) No <input checked="" type="checkbox"/> (Go to C)	
Name of organization receiving discharge:	
Address: (Number and Street):	City:
State:	Zip Code:
Name of Facility (waste treatment plant) which ultimately receives discharge:	
Give your average daily flow into the receiving facility in mgd: mgd	

C. Discharge (See instructions)

Discharge To	Number of Discharge Points	Total Volume Discharged (mgd)
Surface Water	1	2.0
Surface Impoundment With No Effluent		
Underground Percolation		
Well (Injection)		
Other (Describe):		

D. Intermittent discharges (see instructions)

Number of Bypass Points: 0	Overflow Points: 0	Number of Seasonal Discharge Points: 0
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FACILITY DESCRIPTION (Continued)

E. Indicate the type and length (in feet) of the collection system used by this facility. (See instructions)	
Collection System Type: Sanitary	Length (feet): 365.51'
F. Municipalities or Area Served (See instructions)	
NAME	ACTUAL POPULATION SERVED
North and West Hopkinsville	17,000
Forest Park - Greenville Road Area	900
Gainsville Hill Area	450
Total population served: 18,350	

Total estimated average daily waste flow from all industrial sources: 0.05 MGD

G. Maps and drawings (See instructions - Figure A and B)

H. Additional information (Attach additional sheets if needed)

II. BASIC DISCHARGE DESCRIPTION

A. Discharge Serial Number: 001	Discharge Name (if any) Northside Wastewater Treatment Plant
Previous Discharge Serial Number (if any)	001
B. Discharge Operating Dates: Beginning Date (yy/mm)	37/11
If facility is scheduled to discontinue within the next five years give end date (year/month) and reason for discontinuing discharge:	
C. Specify type of discharge point (See instructions) Surface Stream (North Fork of the Little River)	
D. Latitude and longitude of discharge point	
Latitude (degrees/minutes/seconds): 36 degrees, 52 minutes, 20 seconds	Longitude (degrees/minutes/seconds): 87 degrees, 37 minutes, 12 seconds
E. Name the waterway at the point of discharge (See instructions): North Fork of Little River	

II. BASIC DISCHARGE DESCRIPTION (continued)Complete Items F, G, or H as applicable: ☒ Not applicable

F. If discharge is from a bypass point:	WET WEATHER	DRY WEATHER
Check when bypass occurs:	<input type="checkbox"/>	<input type="checkbox"/>
Give the number of bypass incidents	per year	per year
Give the average duration of bypass	hours	hours
Give the average volume per incident	1,000 gallons	1,000 gallons

Give reasons why bypass occurs:

G. If discharge is from an overflow point:	WET WEATHER	DRY WEATHER
Check when overflow occurs	<input type="checkbox"/>	<input type="checkbox"/>
Give the number of overflow incidents:	per year	per year
Give average duration of overflow:	hours	hours
Give average volume per incident	1,000 gallons	1,000 gallons

H. If discharge is intermittent from a holding pond, lagoon, etc: ☒ Not applicable

Give the number of times this discharge occurs per year:	
Give the average volume per discharge occurrence:	(1,000 gallons)
Give the average duration of each discharge:	(days)
List month(s) when the discharge occurs:	

I. Describe treatment units which apply to this discharge:

The influent to the wastewater treatment plant receives the following treatment: preliminary treatment includes screening, comminutor and grit removal;
primary treatment includes clarification; biological treatment includes two trickling filters followed by RBCs with a surface area of 3.8 x 10⁶ sq. feet for BOD removal,
3,690,000 sq. feet for nitrification; secondary treatment is accomplished by 155,106 gallon capacity secondary clarifiers;
post treatment includes chlorine contact chamber, TRC treatment and cascades for post aeration.
Upon thickening and anaerobic digestion, sludge is dried by a filter press.

Using the codes listed in Table I of the instructions, describe in order of occurrence the treatment units applied (see example with Table)

J, M, S, SC, G, C, FT, RBC, WM, M, PG, T, DN, B, VP, X

Describe the sludge handling and disposal methods. (Please indicate disposal site.)

Sludge is dried using a belt filter press. Solid residue is collected, loaded into a 5 sq. yard dump truck and taken to MickeyD Composting Facility.

J. Check if the following are currently available:☐ Engineering Design Report ☒ Operation and Maintenance Manual

II. BASIC DISCHARGE DESCRIPTION (continued)**K. Plant design data**

Plant design flow:	2.88 mgd
Plant design 5-day BOD removal:	96 %
Plant design N removal:	84 %
Plant design P removal:	0 %
Plant design SS removal:	88 %
Plant began operation:	139 (year)
Plant last major revision:	1997 (year)

K. Description of influent and effluent (see instructions)

PARAMETER AND CODE	INFLUENT	EFFLUENT					
	Annual Average Value (1)	Annual Average Value (2)	Lowest Monthly Average Value (3)	Highest Monthly Average Value (4)	Frequency of Analysis (5)	Number of Analyses (6)	Sample Type (7)
50050 Flow Million gallons per day	2.79	1.929	1.735	2.189	Continuous	365	N/A
00400 pH Units			6.81	7.69	5/7	170	G
74028 Temperature (winter) °F							G
74027 Temperature (summer) °F							G
75054 Fecal Streptococci Bacteria Number/100 ml (Provide if available)							
74055 Fecal Coliform Bacteria Number/100 ml (Provide if available)				34	3/7	157	G
74056 Total Coliform Bacteria Number/100 ml (Provide if available)							
00310 BOD mg/l	136.75	2.79	2.17	3.43	3/7	157	C
00340 Chemical Oxygen Demand (COD) (Provide if available) OR 00685 Total Organic Carbon (TOC) (Provide if available)							
50060 Chlorine - Total Residual mg/l	< 0.01	< 0.01	< 0.01	< 0.01	3/7	157	G
00500 Total Solids mg/l							
70300 Total Dissolved Solids mg/l							
00530 Total Suspended Solids mg/l	118.3	5.61	4.54	7.00	3/7	157	C

III. BASIC DISCHARGE DESCRIPTION Description of influent and effluent (continued)

PARAMETER AND CODE	INFLUENT	EFFLUENT					
	Annual Average Value (1)	Annual Average Value (2)	Lowest Monthly Average Value (3)	Highest Monthly Average Value (4)	Frequency of Analysis (5)	Number of Analyses (6)	Sample Type (7)
00545 Settleable Matter (Residue) ml/l							
00610 Ammonia (asN)* mg/l	15.6	0.50	0.32	0.99	3/7	157	C
00625 Kjeldahl Nitrogen* mg/l							
00615 Nitrite (as N)* mg/l							
00620 Nitrate (as N)* mg/l							
00665 Phosphorus Total (as P)* mg/l							
00300 Dissolved Oxygen (DO) mg/l		9.525	7.90	12.1	3/7	157	G
01092 Zinc - Total mg/l	0.134	0.055	0.005	0.180	1/30	12	C
00940 Chloride mg/l							
Hardness - Total (as CaCO ₃) mg/l							

* Provide if available

M. Additional wastewater characteristics (Check box next to each parameter if it is present in the effluent.)

PARAMETER (215)		PARAMETER (215)		PARAMETER (215)	
<input type="checkbox"/>	Bromide 71870	<input type="checkbox"/>	Cobalt 01037	<input type="checkbox"/>	Thallium 01059
<input type="checkbox"/>	Cyanide 00720	<input checked="" type="checkbox"/>	Chromium 01034	<input type="checkbox"/>	Titanium 01152
<input type="checkbox"/>	Fluoride 00951	<input checked="" type="checkbox"/>	Copper 01042	<input type="checkbox"/>	Tin 01102
<input type="checkbox"/>	Sulfide 00745	<input checked="" type="checkbox"/>	Iron 01045	<input type="checkbox"/>	Algicides* 74051
<input type="checkbox"/>	Aluminum 01105	<input type="checkbox"/>	Lead 01051	<input type="checkbox"/>	Chlorinated organic compounds* 74052
<input type="checkbox"/>	Antimony 01097	<input type="checkbox"/>	Manganese 01055	<input type="checkbox"/>	Oil and grease 00550
<input type="checkbox"/>	Arsenic 01002	<input type="checkbox"/>	Mercury 71900	<input type="checkbox"/>	Pesticides* 00550
<input type="checkbox"/>	Beryllium 01012	<input type="checkbox"/>	Molybdenum 01062	<input type="checkbox"/>	Phenols 32730
<input type="checkbox"/>	Barium 01007	<input type="checkbox"/>	Nickel 01067	<input type="checkbox"/>	Surfactants 38260
<input type="checkbox"/>	Boron 10122	<input type="checkbox"/>	Selenium 01147	<input type="checkbox"/>	Radioactivity* 74050
<input type="checkbox"/>	Cadmium 01027	<input checked="" type="checkbox"/>	Silver 01077		

* Provide specific compound and/or element in Part O of this application, if known.

Pesticides (Insecticides, fungicides, and rodenticides) must be reported in terms of the acceptable common names specified in *Acceptable Common Names and Chemical Names for the Ingredient Statement on Pesticide Labels, 2nd Edition*, Environmental Protection Agency, Washington, D.C. 20250, June 1972, as required by Subsection 162.7(b) of the Regulations for the Enforcement of the Federal Insecticide, Fungicide, and Rodenticide Act.

II. BASIC DISCHARGE DESCRIPTION (Continued)

N. Is there an alternative power source for major pumping facility including those for collection system lift stations?

☒ Yes ☐ No

Is there an alarm for power or equipment failure? ☒ Yes ☐ No

O. Additional information:

III. SCHEDULED IMPROVEMENTS AND SCHEDULES OF IMPLEMENTATION (See Instructions)

A. Improvements required:

1. List the discharge serial numbers, assigned in Item II, that are covered by this implementation schedule.

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2. List the authority or authorities which ordered the improvements (See instructions).

3. Specify the 3-character code from Table II, General Action Description, that best describes the improvements required by the implementation schedule. Also list all the Specific Action, 3-character codes which describe in more detail the pollution abatement practices that the implementation schedule requires.

General Action Description			
Specific Action Description(s)			

B. Provide dates imposed by schedule and actual completion dates for implementation steps listed.

Implementation Step	Scheduled Completion (Year/Month/Day)	Actual Completion (Year/Month/Day)
Preliminary plan completion		
Final plan completion		
Financing complete and contract award		
Site acquisition		
Start of construction		
End of Construction		
Start of discharge		
Attainment of operational level		

TO BE COMPLETED FOR EACH MAJOR INDUSTRIAL CONTRIBUTOR

IV. INDUSTRIAL WASTE CONTRIBUTION TO MUNICIPAL SYSTEM (See Instructions)

A. Name of Major Contributing Facility:

Elk Brank Manufacturing Company

Number and Street:

1010 South Campbell Street

City, State, Zip Code:

Hopkinsville, Kentucky 42240

County:

Christian

B. Primary Standard Industrial Classification Code:

2328

C. Principal product or raw material (see instructions).

		Quantity	Units (See Table III)
Product	Blue Jeans	4000	Pair / Day
Raw Material			

Brief description of production process:

Polymer forming (poured cast system)

D. Indicate volume of water discharged into the municipal system:

35,000 (gallons per day)

Is discharge:

☒ Continuous

☐ Intermittent

E. Is pretreatment provided prior to entering the municipal system?

☒ Yes

☐ No

F. Characteristics of wastewater (see instructions).

Parameter Name	pH	TSS	BOD	NH3N			
Parameter Number	00400	00530	00310	00610			
Value	7.55	313.6	602.00	6.16			
Parameter Name							
Parameter Number							
Value							

TO BE COMPLETED FOR EACH MAJOR INDUSTRIAL CONTRIBUTOR

IV. INDUSTRIAL WASTE CONTRIBUTION TO MUNICIPAL SYSTEM (See Instructions)

A. Name of Major Contributing Facility: United States Smokeless Tobacco Manufacturing Limited Liability Partnership	
Number and Street: 1600 North Main Street	
City, State, Zip Code: Hopkinsville, Kentucky 42240	
County: Christian	

B. Primary Standard Industrial Classification Code: 2141, 2131
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C. Principal product or raw material (see instructions).

			Quantity	Units (See Table III)
Product	Leaf Processing (5-6 months/yr)		16 million	pounds
Raw Material	Dry Flower		18 million	pounds

Brief description of production process:

Leaves are treated then sent to year round product processing plant.

D. Indicate volume of water discharged into the municipal system: 20,000 (gallons per day)	
Is discharge: <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent	
E. Is pretreatment provided prior to entering the municipal system? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

F. Characteristics of wastewater (see instructions).

Parameter Name	pH	TSS	BOD	NH3N			
Parameter Number	00400	00530	00310	00610			
Value	7.30	93.8	345.9	14.3			
Parameter Name							
Parameter Number							
Value							

TO BE COMPLETED FOR EACH MAJOR INDUSTRIAL CONTRIBUTOR

IV. INDUSTRIAL WASTE CONTRIBUTION TO MUNICIPAL SYSTEM (See Instructions)

A. Name of Major Contributing Facility: Ebonite International	
Number and Street: 1813 West 7th Street	
City, State, Zip Code: Hopkinsville, Kentucky 42240	
County: Christian	

B. Primary Standard Industrial Classification Code: 3949
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C. Principal product or raw material (see instructions).

		Quantity	Units (See Table III)
Product	Bowling Balls	3000-3500	Balls / day
Raw Material			

Brief description of production process:

Polymer forming (poured cast system)

D. Indicate volume of water discharged into the municipal system: 7,000 (gallons per day)	
Is discharge: <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent	
E. Is pretreatment provided prior to entering the municipal system? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

F. Characteristics of wastewater (see instructions).

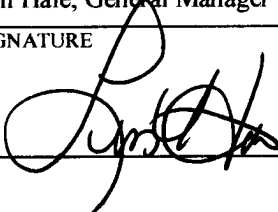
Parameter Name	pH	TSS	BOD	NH3N			
Parameter Number	00400	00530	00310	00610			
Value	7.7	382.2	492.55	40.7			
Parameter Name							
Parameter Number							
Value							

V. PRETREATMENT AND LOCAL LIMITS	
1. Pretreatment Program. Does this facility have an approved pretreatment program?	
<input checked="" type="checkbox"/> Yes (complete item 2 - 4)	<input type="checkbox"/> No (go to Section VI)
2. Is this facility required to establish local limits?	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
3. Are the local limits technically-based?	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
4. Has a technical evaluation of the need to revise this facility's local limits been completed?	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
If yes, attach a copy of the evaluation)	
If no, a copy of the evaluation must be submitted within ninety (90) days of the effective date of your permit.	

VI. BIOLOGICAL TEST DATA (BIOMONITORING)	
1. Does the current KPDES permit require biological testing and reporting?	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No (Complete Item 2)
2. Has biological testing been performed on the POTW effluent?	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
If yes, attach a copy of results and lab sheets.	
(Note: POTWs with flows greater than or equal to 1.0 MGD or POTWs with an approved pretreatment program which receive industrial waste must submit biomonitoring results before the application is deemed complete.)	

VII. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME AND OFFICIAL TITLE (Type or Print)	PHONE NO. (Area Code and Number)
Len Hale, General Manager	(270) 887-4240
SIGNATURE	DATE
	September 21, 2004

NORTHSIDE WWTP ARSENIC

7Q10: 0.23 MGD
 POTW AVG: 1.92 MGD
 NON INDUSTRIAL FLOW: 1.735 MGD
 PERCENT REMOVAL: 45%
 WATER QUALITY: 0.05 MG/L
 AVG POTW INFLUENT CONC: 0.0058 MG/L
 NON INDUSTRIAL CONC: 0.003 MG/L
 INHIBITION: 1.60
 FLOW TO DIGESTER: 0.0054 MGD

UNCONTROLLABLE 8.34 x 0.003 MG/L x 1.74 MGD
 NONINDUSTRIAL **0.04341 LBS/DAY**

POTW INFLUENT LOADING: 8.34 x 0.006 MG/L x 1.92 MGD
0.092874 LBS/DAY

WATER QUALITY: 8.34 [0.050 MG/L x 2.15 MGD] / 1 - 0.45
 PASS THROUGH LIMITATION **1.630091 LBS/DAY**

INHIBITION: 8.34 x 1.60 x 0.005 MG/L / 0.45
0.160128 LBS/DAY

EXISTING INFLUENT: 8.34 x 1.92 MGD x 0.006 MG/L
0.092874 LBS/DAY

FINAL PASS THROUGH LOADING: 0.16 LBS/DAY
 FINAL INHIBITION LOADING: 0.09 LBS/DAY
 FINAL HEADWORKS LOADING 0.16 LBS/DAY
 ALLOWABLE POUNDS PER DAY 0.16 LBS/DAY
 SAFETY FACTOR: 10% : 0.016 LBS/DAY

ACTUAL NONINDUSTRIAL 8.34 x 0.003 MG/L x 1.74 MGD
 UNCONTROLLABLE: **0.04 LBS/DAY**

ALLOWABLE INDUSTRIAL POUNDS:	0.16 LBS/DAY
SAFETY FACTOR:	0.016 LBS/DAY
UNCONTROLABLE	0.043 LBS/DAY
TOTAL:	0.10 LBS/DAY

UNIFORM INDUSTRIAL DISCHARGE LIMIT: 0.1 / 8.34 x 0.18 MGD
0.07 MG/L

LIMIT: 0.07 MG/L

**NORTHSIDE WWTP
SILVER**

7Q10: 0.23 MGD
 POTW AVG: 1.92 MGD
 NON INDUSTRIAL FLOW: 1.735 MGD
 PERCENT REMOVAL: 66%
 WATER QUALITY: 0.0096 MG/L
 AVG POTW INFLUENT CONC: 0.01 MG/L
 NON INDUSTRIAL CONC: 0.007 MG/L
 INHIBITION: 13.00

UNCONTROLLABLE 8.34 x 0.007 MG/L x 1.74 MGD
 NONINDUSTRIAL 0.101289 LBS/DAY

POTW INFLUENT LOADING: 8.34 x 0.010 MG/L x 1.92 MGD
 0.160128 LBS/DAY

WATER QUALITY: 8.34 [0.010 MG/L x 1.92 MGD] / 1 - 0.66
 PASS THROUGH LIMITATION 0.452126 LBS/DAY

INHIBITION: 8.34 x 13.00 x 1.92 MG/L / 1 - .2
 260.208 LBS/DAY

EXISTING INFLUENT: 8.34 x 1.92 MGD x 0.010 MG/L
 0.160128 LBS/DAY

FINAL PASS THROUGH LOADING: 0.45 LBS/DAY
 FINAL INHIBITION LOADING: 0.16 LBS/DAY
 FINAL HEADWORKS LOADING 0.45 LBS/DAY
 ALLOWABLE POUNDS PER DAY 0.45 LBS/DAY
 SAFETY FACTOR: 10% : 0.045 LBS/DAY

ACTUAL NONINDUSTRIAL 8.34 x 0.007 MG/L x 1.74 MGD
 UNCONTROLLABLE: 0.1 LBS/DAY

ALLOWABLE INDUSTRIAL POUNDS: 0.45 LBS/DAY
 SAFETY FACTOR: 0.045 LBS/DAY
 UNCONTROLABLE 0.101 LBS/DAY
 TOTAL: 0.31 LBS/DAY

UNIFORM INDUSTRIAL DISCHARGE LIMIT: 0.31 / 8.34 x 0.18 MGD
 0.20 MG/L

LIMIT: 0.20 MG/L

**NORTHSIDE WWTP
CADMIUM**

7Q10: 0.23 MGD
 POTW AVG: 1.92 MGD
 NON INDUSTRIAL FLOW: 1.735 MGD
 PERCENT REMOVAL: 68%
 WATER QUALITY: 0.0017 MG/L
 AVG POTW INFLUENT CONC: 0.0022 MG/L
 NON INDUSTRIAL CONC: 0.002 MG/L
 INHIBITION: 20.00

UNCONTROLLABLE
 NONINDUSTRIAL $8.34 \times 0.002 \text{ MG/L} \times 1.74 \text{ MGD}$
0.02894 LBS/DAY

POTW INFLUENT LOADING: $8.34 \times 0.002 \text{ MG/L} \times 1.92 \text{ MGD}$
0.035228 LBS/DAY

WATER QUALITY:
 PASS THROUGH LIMITATION $8.34 [0.002 \text{ MG/L} \times 2.15 \text{ MGD}] / 1 - 0.68$
0.095258 LBS/DAY

INHIBITION: $8.34 \times 20.00 \times 1.92 \text{ MG/L} / 1-.15$
376.7718 LBS/DAY

EXISTING INFLUENT: $8.34 \times 1.92 \text{ MGD} \times 0.002 \text{ MG/L}$
0.035228 LBS/DAY

FINAL PASS THROUGH LOADING: 0.10 LBS/DAY
 FINAL INHIBITION LOADING: 0.10 LBS/DAY
 FINAL HEADWORKS LOADING 0.10 LBS/DAY
 ALLOWABLE POUNDS PER DAY 0.10 LBS/DAY
 SAFETY FACTOR: 10% : 0.010 LBS/DAY

ACTUAL NONINDUSTRIAL
 UNCONTROLLABLE: $8.34 \times 0.002 \text{ MG/L} \times 1.74 \text{ MGD}$
0.03 LBS/DAY

ALLOWABLE INDUSTRIAL POUNDS: 0.10 LBS/DAY
 SAFETY FACTOR: 0.010 LBS/DAY
 UNCONTROLABLE 0.029 LBS/DAY
 TOTAL: 0.06 LBS/DAY

UNIFORM INDUSTRIAL DISCHARGE LIMIT: $0.06 / 8.34 \times 0.18 \text{ MGD}$
0.04 MG/L

LIMIT: **0.04 MG/L**

NORTHSIDE WWTP CYANIDE

7Q10: 0.23 MGD
 POTW AVG: 1.92 MGD
 NON INDUSTRIAL FLOW: 1.735 MGD
 PERCENT REMOVAL: 59%
 WATER QUALITY: 0.005 MG/L
 AVG POTW INFLUENT CONC: 0.0085 MG/L
 NON INDUSTRIAL CONC: 0.002 MG/L
 INHIBITION: 4.00

UNCONTROLLABLE
 NONINDUSTRIAL $8.34 \times 0.002 \text{ MG/L} \times 1.74 \text{ MGD}$
0.02894 LBS/DAY

POTW INFLUENT LOADING: $8.34 \times 0.009 \text{ MG/L} \times 1.92 \text{ MGD}$
0.136109 LBS/DAY

WATER QUALITY:
 PASS THROUGH LIMITATION $8.34 [0.005 \text{ MG/L} \times 2.15 \text{ MGD}] / 1 - 0.59$
0.227418 LBS/DAY

INHIBITION: $8.34 \times 4.00 \times 1.92 \text{ MG/L} / 1 - 0.27$
87.74137 LBS/DAY

EXISTING INFLUENT: $8.34 \times 1.92 \text{ MGD} \times 0.009 \text{ MG/L}$
0.136109 LBS/DAY

FINAL PASS THROUGH LOADING: 0.23 LBS/DAY
 FINAL INHIBITION LOADING: 0.14 LBS/DAY
 FINAL HEADWORKS LOADING 0.23 LBS/DAY
 ALLOWABLE POUNDS PER DAY 0.23 LBS/DAY
 SAFETY FACTOR: 10% : 0.023 LBS/DAY

ACTUAL NONINDUSTRIAL
 UNCONTROLLABLE: $8.34 \times 0.002 \text{ MG/L} \times 1.74 \text{ MGD}$
0.03 LBS/DAY

ALLOWABLE INDUSTRIAL POUNDS: 0.23 LBS/DAY
 SAFETY FACTOR: 0.023 LBS/DAY
 UNCONTROLABLE 0.029 LBS/DAY
 TOTAL: **0.18 LBS/DAY**

UNIFORM INDUSTRIAL DISCHARGE LIMIT: $0.18 / 8.34 \times 0.18 \text{ MGD}$
0.11 MG/L

LIMIT: **0.11 MG/L**

NORTHSIDE WWTP COPPER

7Q10: 0.23 MGD
 POTW AVG: 1.92 MGD
 NON INDUSTRIAL FLOW: 1.735 MGD
 PERCENT REMOVAL: 61%
 WATER QUALITY: 0.0182 MG/L
 AVG POTW INFLUENT CONC: 0.0518 MG/L
 NON INDUSTRIAL CONC: 0.012 MG/L
 INHIBITION: 40.00

UNCONTROLLABLE
 NONINDUSTRIAL $8.34 \times 0.012 \text{ MG/L} \times 1.74 \text{ MGD}$
0.173639 LBS/DAY

POTW INFLUENT LOADING: $8.34 \times 0.052 \text{ MG/L} \times 1.92 \text{ MGD}$
0.829463 LBS/DAY

WATER QUALITY:
 PASS THROUGH LIMITATION $8.34 [0.018 \text{ MG/L} \times 2.15 \text{ MGD}] / 1 - 0.61$
0.83678 LBS/DAY

INHIBITION: $8.34 \times 40.00 \times 1.92 \text{ MG/L} / 1 - 0.22$
821.1692 LBS/DAY

EXISTING INFLUENT: $8.34 \times 1.92 \text{ MGD} \times 0.052 \text{ MG/L}$
0.829463 LBS/DAY

FINAL PASS THROUGH LOADING: 0.84 LBS/DAY
 FINAL INHIBITION LOADING: 0.83 LBS/DAY
 FINAL HEADWORKS LOADING: 0.84 LBS/DAY
 ALLOWABLE POUNDS PER DAY: 0.84 LBS/DAY
 SAFETY FACTOR: 10% : 0.084 LBS/DAY

ACTUAL NONINDUSTRIAL
 UNCONTROLLABLE: $8.34 \times 0.012 \text{ MG/L} \times 1.74 \text{ MGD}$
0.17 LBS/DAY

ALLOWABLE INDUSTRIAL POUNDS: 0.84 LBS/DAY
 SAFETY FACTOR: 0.084 LBS/DAY
 UNCONTROLABLE: 0.174 LBS/DAY
 TOTAL: **0.58 LBS/DAY**

UNIFORM INDUSTRIAL DISCHARGE LIMIT: $0.58 / 8.34 \times 0.18 \text{ MGD}$
0.38 MG/L

LIMIT: **0.38 MG/L**

**NORTHSIDE WWTP
CHROMIUM**

7Q10: 0.23 MGD
 POTW AVG: 1.92 MGD
 NON INDUSTRIAL FLOW: 1.735 MGD
 PERCENT REMOVAL: 55%
 WATER QUALITY: 1997 MG/L
 AVG POTW INFLUENT CONC: 0.02 MG/L
 NON INDUSTRIAL CONC: 0.002 MG/L
 INHIBITION: 110.00
 FLOW TO DIGESTER: 0.0054 MGD

UNCONTROLLABLE NONINDUSTRIAL $8.34 \times 0.002 \text{ MG/L} \times 1.74 \text{ MGD}$
0.0289 LBS/DAY

POTW INFLUENT LOADING: $8.34 \times 0.020 \text{ MG/L} \times 1.92 \text{ MGD}$
0.3203 LBS/DAY

WATER QUALITY: PASS THROUGH LIMITATION $8.34 [1997 \text{ MG/L} \times 2.15 \text{ MGD}] / 1 - 0.55$
79574 LBS/DAY

INHIBITION: $8.34 \times 110.0 \times 0.005 \text{ MG/L} / 0.55$
9.0072 LBS/DAY

EXISTING INFLUENT: $8.34 \times 1.92 \text{ MGD} \times 0.020 \text{ MG/L}$
0.3203 LBS/DAY

FINAL PASS THROUGH LOADING: 9.01 LBS/DAY
 FINAL INHIBITION LOADING: 1.74 LBS/DAY
 FINAL HEADWORKS LOADING: 9.01 LBS/DAY
 ALLOWABLE POUNDS PER DAY: 9.01 LBS/DAY
 SAFETY FACTOR: 10% : 0.90 LBS/DAY

ACTUAL NONINDUSTRIAL UNCONTROLLABLE: $8.34 \times 0.002 \text{ MG/L} \times 1.74 \text{ MGD}$
0.029 LBS/DAY

ALLOWABLE INDUSTRIAL POUNDS:	9.01 LBS/DAY
SAFETY FACTOR:	0.90 LBS/DAY
UNCONTROLABLE	0.029 LBS/DAY
TOTAL:	8.08 LBS/DAY

UNIFORM INDUSTRIAL DISCHARGE LIMIT: $8.08 / 8.34 \times 0.18 \text{ MGD}$
5.24 MG/L

LIMIT: **5.24 MG/L**

NORTHSIDE WWTP IRON

7Q10: 0.23 MGD
 POTW AVG: 1.92 MGD
 NON INDUSTRIAL FLOW: 1.734 MGD
 PERCENT REMOVAL: 72%
 WATER QUALITY: 1.00 MG/L
 AVG POTW INFLUENT CONC: 0.8785 MG/L
 NON INDUSTRIAL CONC: 0.028 MG/L
 INHIBITION: 1.00

UNCONTROLLABLE 8.34 x 0.028 MG/L x 1.73 MGD
 NONINDUSTRIAL **0.404924 LBS/DAY**

POTW INFLUENT LOADING: 8.34 x 0.879 MG/L x 1.92 MGD
14.06724 LBS/DAY

WATER QUALITY: 8.34 [1.000 MG/L x 2.15 MGD] / 1 - 0.72
 PASS THROUGH LIMITATION **64.03929 LBS/DAY**

INHIBITION: 8.34 x 1.00 x 1.92 MG/L
16.0128 LBS/DAY

EXISTING INFLUENT: 8.34 x 1.92 MGD x 0.879 MG/L
14.06724 LBS/DAY

FINAL PASS THROUGH LOADING: 16 LBS/DAY
 FINAL INHIBITION LOADING: 14.1 LBS/DAY
 FINAL HEADWORKS LOADING: 8.34 LBS/DAY
 ALLOWABLE POUNDS PER DAY: 14.1 LBS/DAY
 SAFETY FACTOR: 10% : 1.601 LBS/DAY

ACTUAL NONINDUSTRIAL 8.34 x 0.028 MG/L x 1.73 MGD
 UNCONTROLLABLE: **0.4 LBS/DAY**

ALLOWABLE INDUSTRIAL POUNDS: 16.01 LBS/DAY
 SAFETY FACTOR: 1.601 LBS.DAY
 UNCONTROLABLE 0.405 LBS/DAY
TOTAL: 14.01 LBS/DAY

UNIFORM INDUSTRIAL DISCHARGE LIMIT: 14.007 / 8.34 x 0.19 MGD
9.03 MG/L

LIMIT: 9.03 MG/L

**NORTHSIDE WWTP
MERCURY**

7Q10: 0.23 MGD
 POTW AVG: 1.92 MGD
 NON INDUSTRIAL FLOW: 1.735 MGD
 PERCENT REMOVAL: 50%
 WATER QUALITY: 0.000012 MG/L
 AVG POTW INFLUENT CONC: 0.0011 MG/L
 NON INDUSTRIAL CONC: 0.002 MG/L
 INHIBITION: 0.10

UNCONTROLLABLE
 NONINDUSTRIAL $8.34 \times 0.002 \text{ MG/L} \times 1.74 \text{ MGD}$
0.02894 LBS/DAY

POTW INFLUENT LOADING: $8.34 \times 0.001 \text{ MG/L} \times 1.92 \text{ MGD}$
0.017614 LBS/DAY

WATER QUALITY:
 PASS THROUGH LIMITATION $8.34 [0.000 \text{ MG/L} \times 2.15 \text{ MGD}] / 1 - 0.50$
0.00043 LBS/DAY

INHIBITION: $8.34 \times 0.10 \times 1.92 \text{ MG/L} / 1 - 1.10$
1.7792 LBS/DAY

EXISTING INFLUENT: $8.34 \times 1.92 \text{ MGD} \times 0.001 \text{ MG/L}$
0.017614 LBS/DAY

FINAL PASS THROUGH LOADING: 0.00 LBS/DAY
 FINAL INHIBITION LOADING: 0.02 LBS/DAY
 FINAL HEADWORKS LOADING 0.00 LBS/DAY
 ALLOWABLE POUNDS PER DAY 0.00 LBS/DAY
 SAFETY FACTOR: 10% : 0.000 LBS/DAY

ACTUAL NONINDUSTRIAL
 UNCONTROLLABLE: $8.34 \times 0.002 \text{ MG/L} \times 1.74 \text{ MGD}$
0.03 LBS/DAY

ALLOWABLE INDUSTRIAL POUNDS: 0.00 LBS/DAY
 SAFETY FACTOR: 0.000 LBS/DAY
 UNCONTROLABLE 0.029 LBS/DAY
 TOTAL: **-0.03 LBS/DAY**

UNIFORM INDUSTRIAL DISCHARGE LIMIT: $(0.03) / 8.34 \times 0.18 \text{ MGD}$
(0.02) MG/L

LIMIT: **(0.02) MG/L = 0.0005 mg/l**

**NORTHSIDE WWTP
NICKEL**

7Q10: 0.23 MGD
 POTW AVG: 1.92 MGD
 NON INDUSTRIAL FLOW: 1.735 MGD
 PERCENT REMOVAL: 29%
 WATER QUALITY: 0.24 MG/L
 AVG POTW INFLUENT CONC: 0.0774 MG/L
 NON INDUSTRIAL CONC: 0.01 MG/L
 INHIBITION: 10.00
 FLOW TO DIGESTER: 0.0054 MGD

UNCONTROLLABLE
 NONINDUSTRIAL $8.34 \times 0.010 \text{ MG/L} \times 1.74 \text{ MGD}$
0.144699 LBS/DAY

POTW INFLUENT LOADING: $8.34 \times 0.077 \text{ MG/L} \times 1.92 \text{ MGD}$
1.239391 LBS/DAY

WATER QUALITY:
 PASS THROUGH LIMITATION $8.34 [0.241 \text{ MG/L} \times 2.15 \text{ MGD}] / 1 - 0.29$
6.086438 LBS/DAY

INHIBITION: $8.34 \times 10.00 \times 0.01 \text{ MG/L} / 0.29$
1.552966 LBS/DAY

EXISTING INFLUENT: $8.34 \times 1.92 \text{ MGD} \times 0.077 \text{ MG/L}$
1.239391 LBS/DAY

FINAL PASS THROUGH LOADING: 1.55 LBS/DAY
 FINAL INHIBITION LOADING: 1.24 LBS/DAY
 FINAL HEADWORKS LOADING 1.55 LBS/DAY
 ALLOWABLE POUNDS PER DAY 1.55 LBS/DAY
 SAFETY FACTOR: 10% : 0.155 LBS/DAY

ACTUAL NONINDUSTRIAL
 UNCONTROLLABLE: $8.34 \times 0.010 \text{ MG/L} \times 1.74 \text{ MGD}$
0.14 LBS/DAY

ALLOWABLE INDUSTRIAL POUNDS: 1.55 LBS/DAY
 SAFETY FACTOR: 0.155 LBS/DAY
 UNCONTROLABLE 0.145 LBS/DAY
TOTAL: 1.25 LBS/DAY

UNIFORM INDUSTRIAL DISCHARGE LIMIT: $1.25 / 8.34 \times 0.18 \text{ MGD}$
0.81 MG/L

LIMIT: 0.81 MG/L

NORTHSIDE WWTP LEAD

7Q10: 0.23 MGD
 POTW AVG: 1.92 MGD
 NON INDUSTRIAL FLOW: 1.735 MGD
 PERCENT REMOVAL: 57%
 WATER QUALITY: 0.01 MG/L
 AVG POTW INFLUENT CONC: 0.0512 MG/L
 NON INDUSTRIAL CONC: 0.0006 MG/L
 INHIBITION: 340.00

UNCONTROLLABLE 8.34 x 0.001 MG/L x 1.74 MGD
 NONINDUSTRIAL 0.008682 LBS/DAY

POTW INFLUENT LOADING: 8.34 x 0.051 MG/L x 1.92 MGD
 0.819855 LBS/DAY

WATER QUALITY: 8.34 [0.006 MG/L x 2.15 MGD] / 1 - 0.57
 PASS THROUGH LIMITATION 0.2502 LBS/DAY

INHIBITION: 8.34 x 340 x 1.92 MG/L / 1-.57
 12661.28 LBS/DAY

EXISTING INFLUENT: 8.34 x 1.92 MGD x 0.051 MG/L
 0.819855 LBS/DAY

FINAL PASS THROUGH LOADING: 0.25 LBS/DAY
 FINAL INHIBITION LOADING: 0.82 LBS/DAY
 FINAL HEADWORKS LOADING 0.25 LBS/DAY
 ALLOWABLE POUNDS PER DAY 0.25 LBS/DAY
 SAFETY FACTOR: 10% : 0.025 LBS/DAY

ACTUAL NONINDUSTRIAL 8.34 x 0.001 MG/L x 1.74 MGD
 UNCONTROLLABLE: 0.01 LBS/DAY

ALLOWABLE INDUSTRIAL POUNDS: 0.25 LBS/DAY
 SAFETY FACTOR: 0.025 LBS/DAY
 UNCONTROLABLE 0.009 LBS/DAY
 TOTAL: 0.22 LBS/DAY

UNIFORM INDUSTRIAL DISCHARGE LIMIT: 0.22 / 8.34 x 0.18 MGD
 0.14 MG/L

LIMIT: 0.14 MG/L

**NORTHSIDE WWTP
ZINC**

7Q10: 0.23 MGD
 POTW AVG: 1.92 MGD
 NON INDUSTRIAL FLOW: 1.735 MGD
 PERCENT REMOVAL: 67%
 WATER QUALITY: 0.162 MG/L
 AVG POTW INFLUENT CONC: 0.1269 MG/L
 NON INDUSTRIAL CONC: 0.053 MG/L
 INHIBITION: 400.00

UNCONTROLLABLE 8.34 x 0.053 MG/L x 1.74 MGD
 NONINDUSTRIAL 0.766905 LBS/DAY

POTW INFLUENT LOADING: 8.34 x 0.127 MG/L x 1.92 MGD
 2.032024 LBS/DAY

WATER QUALITY: 8.34 [0.162 MG/L x 2.15 MGD] / 1 - 0.67
 PASS THROUGH LIMITATION 8.802491 LBS/DAY

INHIBITION: 8.34 x 400 x 1.92 MG/L / 1-0.27
 8774.137 LBS/DAY

EXISTING INFLUENT: 8.34 x 1.92 MGD x 0.127 MG/L
 2.032024 LBS/DAY

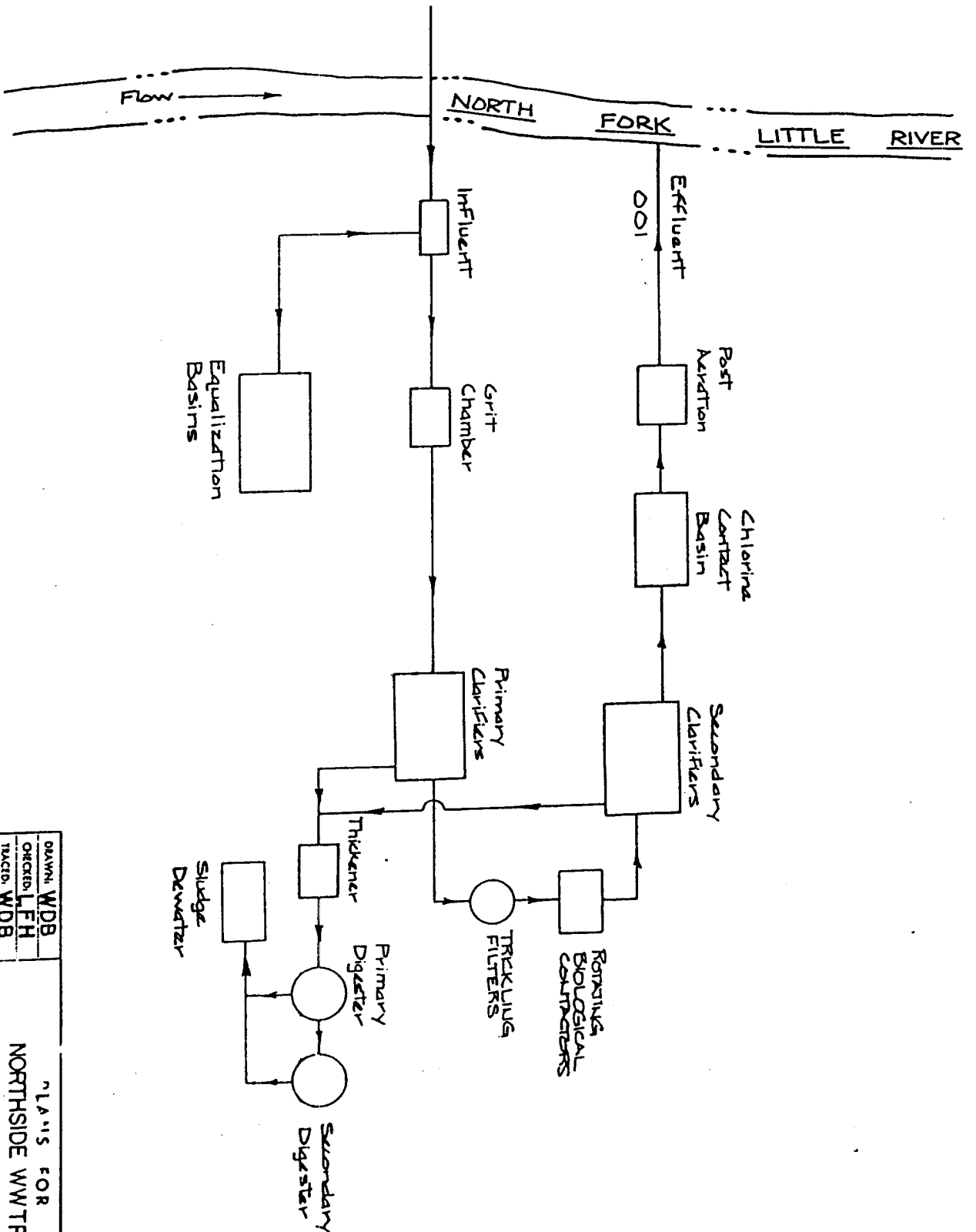
FINAL PASS THROUGH LOADING: 8.8 LBS/DAY
 FINAL INHIBITION LOADING: 2.03 LBS/DAY
 FINAL HEADWORKS LOADING 8.8 LBS/DAY
 ALLOWABLE POUNDS PER DAY 8.8 LBS/DAY
 SAFETY FACTOR: 10% : 0.880 LBS/DAY

ACTUAL NONINDUSTRIAL 8.34 x 0.053 MG/L x 1.74 MGD
 UNCONTROLLABLE: 0.77 LBS/DAY

ALLOWABLE INDUSTRIAL POUNDS: 8.80 LBS/DAY
 SAFETY FACTOR: 0.880 LBS.DAY
 UNCONTROLABLE 0.767 LBS/DAY
 TOTAL: 7.16 LBS/DAY

UNIFORM INDUSTRIAL DISCHARGE LIMIT: 7.16 / 8.34 x 0.18 MGD
 4.64 MG/L

LIMIT: 4.64 MG/L



DRAWN: WDB		PLANS FOR	
CHECKED: LEH		NORTHSIDE WWTP	
TRACED: WDB		CHRISTIAN CO. KENTUCKY	
APPROVED: CFL			
SCALE: NTS		SCHEMATIC OF FLOW	
REVISIONS		DATE	
DATE	DESCRIPTION	BY	HOWARD K. BELL
9-22-82			CONSULTING ENGINEER, INC.
			LEXINGTON, KENTUCKY
		SHEET NO.	
		2 of 2	

**REPORT OF THE CHRONIC DEFINITIVE
TOXICITY TEST RESULTS ON FINAL
EFFLUENT FROM THE
NORTHSIDE WWTP**

**REPORT OF THE CHRONIC DEFINITIVE
TOXICITY TESTS RESULTS ON FINAL
EFFLUENT FROM THE
NORTHSIDE WWTP**

Prepared for:

**HOPKINSVILLE WATER ENVIRONMENT AUTHORITY
Hopkinsville, Kentucky**

Prepared by:

**ELAB of Tennessee
227 French Landing Drive
Nashville, Tennessee 37228
(615) 345-1115**

July 2004

This report contains 32 pages

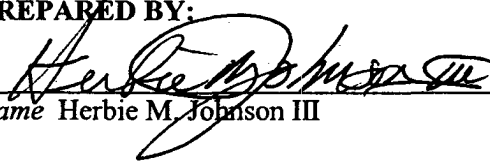


ELAB of TENNESSEE
Formerly Eckenfelder Laboratory

QUALITY ASSURANCE DOCUMENTATION

This document has been prepared, reviewed, and approved by the following
ELAB of Tennessee personnel:

PREPARED BY:


Name Herbie M. Johnson III

7-23-04
Date

Group Leader II

Title

APPROVED BY:


Name Erin Whitwell

7-23-04
Date

Scientist I

Title



ELAB of TENNESSEE
Formerly Eickbush Laboratory

July 23, 2004

Mrs. Jenny Moss
HWEA
P.O. Box 628
Hopkinsville, KY 42241

Dear Mrs. Moss:

The report of the results of the chronic definitive toxicity test conducted on the Northside final effluent composite samples collected on July 12, 14 and 16, 2004, is presented in Appendix A. The test organism was *Ceriodaphnia dubia*.

There were no significant effects on *C. dubia* survival or reproduction. The data yielded a No Observed Effect Concentration (NOEC) of 100 percent and a Lowest Observed Effect Concentration (LOEC) of >100 percent. The EC25 was estimated as >100 percent. The chronic Toxicity Unit was estimated as 1.00 TUc (permit limits 1.08 TUc).

If you have any questions, please contact me at (615) 345-1119, ext. 227.

Sincerely,

ELAB of Tennessee

Herbie M. Johnson III
Group Leader
Aquatic Toxicology Laboratory

Enclosures

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<u>Appendices</u>	<u>Title</u>
A	ELAB of Tennessee Toxicity Test Report
B	Kentucky Toxicity Test Report
C	Raw Data Sheets
D	Statistical Analyses
E	Reference Toxicant Data
F	Chain of Custody Forms

INTRODUCTION

Municipal and industrial dischargers are required, as part of the National Pollutant Discharge Elimination System (NPDES), to measure the toxicity of their wastewater's. The permit requirement may be for monitoring purposes only or may contain toxicity limits. The types of tests required vary from state to state and may depend on flow conditions or dilution by the receiving water. The most common tests required are acute tests, which measure the short-term toxicity of the wastewater. The test duration may vary from 24 hours to 96 hours, depending on the organism tested and the state requirements. Mini-chronic tests can be used to look at longer-term toxicity. These tests involve more subtle effects on the organism, e.g., growth and reproduction, and last seven days.

The organisms used in these tests have been limited to those that are easily cultured in the laboratory. This ensures that the quality and health of the organisms are consistent over time and do not affect the results of the test. The fish species most often used is *P. promelas*. The invertebrates used are the water fleas (*Daphnia pulex*, *Daphnia magna*, and *Ceriodaphnia* sp.) which are freshwater crustaceans. The culturing methods for these organisms have been outlined by the U. S. Environmental Protection Agency (USEPA) and the American Society for Testing and Materials (ASTM).

The State of Kentucky has issued a KPDES permit (KY0023388) to the Northside WWTP in Hopkinsville, Kentucky. The KPDES permit requires the Northside WWTP to conduct chronic definitive tests with *C. dubia*. The permit issued to Hopkinsville-Northside WWTP states that noncompliance with the toxicity limit will be demonstrated if the IC25 is less than 93.0 percent effluent.

METHODS

Test procedures adhered to methods outlined in the U. S. Environmental Protection Agency Manual, " Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms," Fourth Edition, EPA 821-R-02-013, October, 2002. Any modifications in the procedures were made according to the Kentucky Department of Environmental Protection Manual, "Methods for Culturing and Conducting Toxicity Tests with *Pimephales promelas*, *Daphnia pulex*, and *Ceriodaphnia* sp.", Second Edition, January, 1987.

The samples were received on July 12, 14 and 16, 2004, from the Northside WWTP. The temperature range of the samples were 2.0 C to 2.8 C upon receipt in the laboratory, and were adjusted to 25°C ±1°C in a warm water bath before use in the test. Water chemistry parameters were measured on each sample and control water and were recorded on the appropriate data sheet. Parameters measured were pH, dissolved oxygen, temperature, conductivity, hardness, alkalinity, and residual chlorine. In addition, dissolved oxygen, temperature, and pH measurements were made for each test concentration and control solution prior to and after each daily renewal.

The *C. dubia* test was started with young who were less than 24 hours old. The test concentrations were 100, 93.0, 46.5, 23.3, and 11.6 percent plus a control. The organisms were placed individually in 30-ml plastic cups containing 15 ml of either effluent test solution or control water. Control and dilution water was laboratory reconstituted water made according to USEPA procedures and had an average hardness of 98 mg/L. Ten cups were used for each exposure concentration and the control. Each organism was fed a combination of chow (consisting of digested flake food, yeast, and cereal leaves) and algae (*Selenastrum capricornutum*) daily along with solution renewal. The cups were checked daily for mortality and the number of young released over the test period. The total numbers of young released in the test solutions were then compared to the controls to see if an effect occurred. The test was acceptable because 80.0 percent or more of the controls survived, 60.0 percent of the controls had three broods, and the mean number of young per surviving control female was 15 or greater.

QUALITY ASSURANCE

The *C. dubia* were obtained from cultures maintained by ELAB of Tennessee according to USEPA recommended procedures (EPA 821-R-02-012 and EPA 821-R-02-013). The *C. dubia* stock was originally obtained from Aquatic BioSystems, Fort Collins, Colorado.

The control water used in the tests was reconstituted water made with Nanopure II ultrapure water to which were added appropriate amounts of KCl₂, MgCl₂, NaHCO₃, CaSO₄, selenium, and Perrier® de mineralized water. The pH, conductivity, dissolved oxygen, hardness, alkalinity, and residual chlorine of the laboratory water were checked prior to use. Adjustments to these parameters were made if they fell outside the acceptable ranges. The water quality data for the water were recorded in the Water Chemistry Log.

The Kentucky Toxicity Test Report is provided in Appendix B. Copies of the Raw Data sheets are provided in Appendix C. A Copy of the Statistical Analysis is provided in Appendix D. Reference toxicant tests are conducted every month on all of the organisms cultured in our laboratory. The tests are acute and chronic, and the reference toxicant is sodium chloride. Data sheets with LC50, NOEC, and IC25 values are kept in laboratory notebooks. The results of the latest Reference Toxicant test for *C. dubia* are provided in Appendix E. Copies of the chain of custody forms that accompanied the samples are provided in Appendix F.

This document has been prepared, reviewed, and approved by ELAB of Tennessee.

RESULTS

There were no significant effects on *C. dubia* survival or reproduction. There were 90 to 100 percent survivals in the test concentrations and control. The total number of young produced was 248 in the control compared to 307, 315, 283, 266 and 229 in the 11.6, 23.3, 46.5, 93, and 100 percent effluent, respectively. The reproduction data was analyzed by Dunnett's Multiple Comparison Test, using the TOXCALC® program. Significance was determined at the 0.05 confidence level. The No Observed Effect Concentration (NOEC) was 100 percent, the Lowest Observed Effect Concentration (LOEC) was >100 percent and the IC25 was estimated as >100 percent. The Chronic Toxicity Units (TUc) were estimated as 1.0 TUc.

APPENDIX A
ELAB of Tennessee
TOXICITY TEST REPORT

REPORT OF AQUATIC TOXICITY TEST RESULTS

I. GENERAL INFORMATION

A. Plant Information

Industry: HWEA-Hammond Wood WWTP Permit No.: KY0023388

Address: Cadiz Road Contact: Kathy Marsh
Hopkinsville, KY 42240

Phone Number: (270) 887-4251

Type of Plant: POTW

Plant Operating Schedule: 24 hr

Receiving Stream: North Fork of Little River

B. Sample(s)

Source(s): Final Effluent

Collection Period: 07/11/04 to 07/16/04

Type of Collection: 3-24 Hour Composites

Collected by: Kathy Marsh

ELAB of Tennessee Sample Log No.(s): 0407072, 0407094, 0407122

Alkalinity (mg/L as CaCO_3): 81*

Conductivity ($\mu\text{mhos/cm}$): 704*

Hardness (mg/L as CaCO_3): 147*

pH (standard units): 7.88* (7.82 to 8.06)

Test Temperature ($^{\circ}\text{C}$): 25.3* (24.3 to 25.8)

Residual Chlorine (mg/L): <0.02 on all samples.

*Mean value for seven day measurements taken from *C. dubia* data sheet.

REPORT OF AQUATIC TOXICITY TEST RESULTS (Cont'd)

II. DATA FOR WATER FLEA TESTS

A. Test Type

<input checked="" type="checkbox"/> Renewal	<input type="checkbox"/> 24 hr	<input checked="" type="checkbox"/> Static	<input type="checkbox"/> Acute
<input type="checkbox"/> Nonrenewal	<input type="checkbox"/> 48 hr	<input type="checkbox"/> Flowthrough	<input checked="" type="checkbox"/> Chronic
	<input type="checkbox"/> 96 hr		
	<input checked="" type="checkbox"/> 7 day		

B. Test Organism

Common Name: Water Flea Scientific Name: *Ceriodaphnia dubia*

Age: <24 hr Source: ELAB of Tennessee cultures

Observed Diseases: None

Treatment: None

Acclimation: Held in control water prior to testing

C. Test Method - Reference Material

Short-term Methods for Estimating Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, USEPA, Fourth Edition, October, 2002.

Methods for Culturing and Conducting Toxicity Tests with Pimephales promelas, Daphnia pulex and Ceriodaphnia sp. Second Edition, January, 1987. Kentucky Department for Environmental Protection.

D. Dilution Water

Source: Reconstituted Water	Collection Period: Daily
Type Collection: Grab	Pretreatment: None
Alkalinity (mg/L as CaCO ₃): 64*	Hardness (mg/L as CaCO ₃): 98*
Conductivity (µmhos/cm): 278*	pH (standard units): 8.26* (8.21 – 8.34)
Test Temperature (°C): 25.2 (24.6 to 25.4)*	

*Mean value for seven days.

.REPORT OF AQUATIC TOXICITY TEST RESULTS (Cont'd)

E. Test Chambers

Composition: Plastic

Depth: 20 mm

Size: 30 mL

Test Volume per Chamber: 15 mL

F. Loading Technique

Organisms per concentration: 10

Replicates per concentration: 10

Organisms per replicate: 1

G. Testing Dates

Start: 07/13/04 (11:00Hrs)

Complete: 07/20/04 (11:10Hrs)

H. Summary Of Test Observations

1. Most sensitive index: None Observed

LOEC: >100%

NOEC: 100%

ChV: N/A

IC25: >100%

Confidence Limits: N/A

Method: Dunnett's Multiple Comparison Test. ToxCalc v5.0.23

REPORT OF AQUATIC TOXICITY TEST RESULTS (Cont'd)

2. Data Summary

	Concentration (% Effluent)	No. Live Adults	Survival Rate (%)	Total Live Young
1.	Control	9	90.0	248
2.	11.6	10	100	307
3.	23.3	10	100	315
4.	46.5	9	90.0	283
5.	93.0	9	90.0	266
6.	100	10	100	229
7.				
8.				
9.				

3. Comments:
None

I. Attachment

 X Data Summary Sheets

 Other:

By:



Date:

7-23-04

ELAB of Tennessee
227 French Landing Drive
Nashville, TN 37228


(615) 345-1115

APPENDIX B
KENTUCKY TOXICITY TEST REPORT

Test Types: Acute ☐ Screen ☐
 Chronic ☒ Definitive ☒

KENTUCKY TOXICITY TEST REPORT SHEET

- 1) Facility/Discharger: Northside WWTP Report Date: 07/23/04
- 2) Address: Cadiz Road, P.O. Box 628, Hopkinsville, KY 42241
- 3) KPDES Permit #: 0023388 4) Receiving Stream: North Fork of Little River
- 5) Facility Contact: Jenny Moss 6) Phone #: (270) 887-4251
- 7) Consultant/Testing Lab Name: ELAB of Tennessee
- 8) Lab Contact: Herbie M. Johnson III Phone #: (615) 345-1119 Ext. 247
- 9) Outfall(s) Tested: 001
- 10) Average daily flow on days sampled (MGD): _____
- 11) Test Species: #1 Ceriodaphnia dubia #2 _____
- 12) Species Age: #1 <24 hr #2 _____
- 13) Organism Source: #1 In-house cultures #2 _____
- 14) Acclimation Procedure: #1 Held in control water prior to testing
 #2 _____
- 15) Test Conditions: Static _____ Static-Renewal X
- 16) Dilution Water Type (synthetic, receiving stream): Synthetic
- 17) Aeration? (Before/During Test): No
- 18) Dechlorination?: No Original Chlorine Level: <0.02 mg/L


 Signature of person filing out form

Herbie M. Johnson III

Name (typed or printed)

7-23-04

Date

Group Leader II

Title

SAMPLING SUMMARY

Outfall	Type Grab/Composite	Volume Collected	Sample Collection		Rain Event?
			Begin MM/DD/Time	End MM/DD/Time	
001	Composite	2-Liters	07/11/04 7 a.m.	07/12/04 7 a.m.	No
001	Composite	2-Liters	07/13/04 7 a.m.	07/14/04 7 a.m.	No
001	Composite	2-Liters	07/15/04 7 a.m.	07/16/04 7 a.m.	No

DATES/TIMES OF TEST PERFORMANCE:

Species #1

Species #2

Ceriodaphnia dubia

(name)

(name)

07/13/04 – 11:00 Hrs

07/20/04 – 11:10 Hrs

TOXICITY TEST RESULTS

Results of a Ceriodaphnia Dubia 7 day Chronic Toxicity Test
 (Genus) (Species) (Type/Duration)

Conducted 07/13/04 - 07/20/04 Using Effluent from Outfall 001
 (mm/dd/yy) (mm/dd/yy) (number)

Test Solution	Percent Surviving (time intervals used--day/hour)								# of Young		Dry Weight	
									Total	Mean	Total	Mean
	0	1	2	3	4	5	6	7				
Control	100	100	100	100	90	90	90	90	248	24.8		
11.6 % Effluent	100	100	100	100	100	100	100	100	307	30.7		
23.3 % Effluent	100	100	100	100	100	100	100	100	315	31.5		
46.5 % Effluent	100	100	100	100	100	90	90	90	283	28.3		
93.0 % Effluent	100	100	100	100	100	100	90	90	266	26.6		
100 % Effluent	100	100	100	100	100	100	100	100	229	22.9		
LC50/IC25 Value	>100%								Calculated TU Estimate* 1.00 (indicate acute/ <u>chronic</u>)			
95% Confidence Limits												
LL	Not Given								Permit Limits 1.08 TUC			
UL	Not Given								(indicate TU _a /TU _c)			
LL = Lower Limit									If acute test, method used to determine LC ₅₀ and Confidence Limit values:			
UL = Upper Limit												

*Note: $TU_a = 100/LC_{50}$; $TU_c = 100/IC_{25}$

Reference Toxicant Test Results					
Species	Date	Time	Duration	Toxicant	Results (LC ₅₀ /IC ₂₅)
<u>C. dubia</u>	<u>7/8/04</u>	<u>11:00Hrs</u>	<u>7 days</u>	<u>NaCl</u>	<u>IC25 = 731.62 mg/L</u>

ADDITIONAL TOXICITY TEST INFORMATION

- 1) Submit copies of all bench sheets and statistical calculations/printouts obtained during the test(s). Data must be presented in tabular form and must include all physical and/or chemical measurements recorded during the tests (e.g., temperature, conductivity, total residual chlorine, dissolved oxygen, etc.).
- 2) Methods/Instrumentation used in chemical analysis:

Dissolved oxygen: Standard Methods 20th ed. 4500-O G. YSI Model 57 Oxygen Meter

pH: Standard Methods 20th ed. 4500H+ B. Orion pH meter Model 420A

Temperature: Standard Methods 20th ed. 2550B. Orion Model 140 Conductivity / Temperature / Salinity Meter

Conductivity: Standard Methods 20th ed. 2510B. Orion Model 140 Conductivity / Temperature / Salinity Meter

Alkalinity: Standard Methods 20th ed. 2320B. Potentiometric Titration

Hardness: Standard Methods 20th ed. 2340C. Hach Kit

Total Residual Chlorine: Standard Methods 4500CL F Titrametric DPD-FAS

Short-term Methods for Estimating Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, USEPA, Fourth Edition, October, 2002.

Methods for Culturing and Conducting Toxicity Tests with Pimephales promelas, Daphnia pulex and Ceriodaphnia sp. Second Edition, January, 1987. Kentucky Department for Environmental Protection.

- 3) Indicate below any other relevant information that may aid in the evaluation of this report. Include any deviations from EPA methodology that were necessary for these tests as well as any sample manipulations which were performed, such as aeration, dechlorination with sodium thiosulfate, etc. and the justification for such manipulations or deviations. Attach additional pages as needed.

APPENDIX C
RAW DATA SHEETS

DAY		(0)	1	(2)	3	(4)	5	6	7	8
INITIALS/FEED/CHEMISTRY		EW	EW	EW	EW	EW	EW	EW	EW	EW
TIME OF RENEWAL			12:15	1:15	8:00	12:30	14:00	10:00	11:00	
pH (Standard Unit) Initial/Final	Ctrl	8.33	8.22 8.57 8.21 8.45	8.21 8.32	8.26 8.49	8.34 8.44	8.26 8.32	8.21 8.29	8.39	
	11.6%	8.18	8.18 8.47 8.20 8.45	8.25 8.37	8.22 8.49	8.32 8.42	8.21 8.29	8.38	8.38	
	23.3	8.13	8.14 8.46 8.12 8.43	8.21 8.35	8.21 8.48	8.24 8.38	8.15 8.33	8.30	8.30	
	46.5	8.02	8.03 8.46 8.04 8.47	8.15 8.36	8.06 8.5	8.09 8.45	8.04 8.36	8.39	8.39	
	93	7.89	7.91 8.48 7.91 8.48	8.08 8.36	7.88 8.47	7.88 8.46	7.84 8.27	8.32	8.32	
	100	7.87	7.87 8.47 7.90 8.47	8.06 8.34	7.86 8.52	7.82 8.42	7.82 8.32	7.37	7.37	
Dissolved Oxygen (mg/L) Initial/Final	Ctrl	7.3	7.1 7.1 7.1 7.3	7.3 7.3	7.0 6.8	7.3 7.2	7.4 7.2	7.1	7.1	
	11.6%	7.4	7.2 7.2 7.1 7.3	7.4 7.3	7.1 6.7	7.2 7.1	7.2 7.2	7.2	7.2	
	23.3	7.2	7.1 7.3 7.3 7.2	7.4 7.4	7.3 6.7	7.1 7.0	7.1 7.1	7.2	7.2	
	46.5	7.4	7.3 6.9 7.4 7.1	7.4 7.4	7.4 6.8	7.3 7.1	7.3 7.1	7.1	7.1	
	93	8.3	7.4 7.0 7.0 7.3	7.6 7.5	7.8 6.8	8.6 7.1	7.7 7.2	7.5	7.5	
	100	8.5	8.0 7.2 8.1 7.3	7.9 7.6	7.5 6.5	8.9 7.2	7.9 7.5	7.5	7.5	
Temperature (°C) Initial/Final	Ctrl	24.6	25.3 25.7 25.4 25.5	25.4 25.3	25.0 25.0	25.3 25.3	25.1 25.3	25.6	25.6	
	11.6%	24.8	25.3 25.7 25.4 25.5	25.4 25.2	25.2 25.0	25.3 25.2	25.1 25.2	25.5	25.5	
	23.3	24.7	25.3 25.5 25.5 25.2	25.5 25.1	25.4 25.0	25.3 25.1	25.1 25.1	25.4	25.4	
	46.5	24.6	25.3 25.6 25.6 25.4	25.6 25.1	25.4 24.8	25.3 25.2	25.0 25.1	25.3	25.3	
	93	24.4	25.4 25.6 25.7 25.4	25.8 25.1	25.2 25.0	25.3 25.0	24.9 24.9	25.1	25.1	
	100	24.3	25.3 25.5 25.7 25.2	25.9 24.9	25.2 24.8	25.4 24.9	24.8 24.8	25.0	25.0	
Conductivity (umho/cm) or Salinity (ppt)	Ctrl	305	307 307	270 274	276 276	276 276	280 280			
	11.6%	328	329 316	335 335	326 326	319 319	324 324			
	23.3	381	381 368	394 394	365 365	363 363	363 363			
	46.5	488	493 468	508 508	455 455	445 445	458 458			
	93	488	507 451	472 472	600 600	614 614	628 628			
	100	720	745 689	804 804	640 640	667 667	661 661			
Alkalinity (mg/L CaCO ₃)	Ctrl	64	64 64	64 64	64 64	64 64	64 64			
	100%	80	80 90	90 90	75 75	75 75	75 75			
Hardness (mg/L CaCO ₃)	Ctrl	98	98 98	98 98	98 98	98 98	98 98			
	100%	158	158 120	120 120	158 158	158 158	158 158			
Residual Chlorine	Amount Detected mg/L	100%	20.02mg/L	20.02mg/L	20.02	20.02				
	Amount of Na ₂ S ₂ O ₃ Added (ml)									

Client Name: NorthsideSet-up By rwTerminated By EWDate / Time Set-up 7-13-04 / 11:00Test Species C. dubia Source: 7-2-04 Broad Board Age: < 24hDate / Time Ended 7-20-04 / 11:10Dilution Water: C. mod HardRepetitions 10 Animals per Rep. 1 Organisms per Concentration 10 Stock Source/Temp.: 25°C ± 1°CCOMMENTS: All Temperatures are taken with Thermometer #5. Circled days indicate use of new samples. Randomization produced by Excel Macro.ELab Log # 0407072A, 0407094A, 0407122A

DATE = 7/13/04
 CLIENT = Northside
 ORGANISM = C. dubia

CHRONIC TOXICITY TESTS
 WATER CHEMISTRY DATA CALCULATION SHEET

	DAY:	0	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B	7	AVG.	MIN.	MAX.	AVG.: INIT.	MIN.: INIT.	MAX.: INIT.	AVG.: FINAL	MIN.: FINAL	MAX.: FINAL
PH	CONTROL	8.33	8.22	8.57	8.21	8.45	8.21	8.32	8.28	8.44	8.34	8.44	8.26	8.32	8.39	8.33	8.21	8.57	8.28	8.21	8.34	8.41	8.32	8.57
	11.6%	8.18	8.18	8.47	8.20	8.45	8.23	8.37	8.22	8.49	8.32	8.42	8.21	8.29	8.33	8.30	8.18	8.49	8.22	8.18	8.32	8.40	8.29	8.49
	23.3%	8.13	8.14	8.46	8.12	8.43	8.21	8.35	8.21	8.48	8.24	8.38	8.15	8.33	8.30	8.26	8.12	8.48	8.17	8.12	8.24	8.39	8.30	8.48
	46.5%	8.02	8.03	8.46	8.04	8.47	8.15	8.36	8.06	8.51	8.09	8.45	8.04	8.36	8.39	8.20	8.02	8.51	8.06	8.02	8.15	8.43	8.36	8.51
	9.3%	7.89	7.91	8.48	7.91	8.48	8.08	8.36	7.88	8.47	7.88	8.41	7.84	8.27	8.38	8.09	7.84	8.48	7.91	7.84	8.08	8.40	8.27	8.48
D.O.	CONTROL	7.3	7.1	7.1	7.1	7.3	7.3	7.3	7.0	6.8	7.3	7.2	7.4	7.2	7.1	7.2	6.8	7.4	7.2	7.0	7.4	7.1	6.8	7.3
	11.6%	7.4	7.2	7.2	7.1	7.3	7.4	7.3	7.1	6.7	7.2	7.2	7.2	7.2	7.2	7.2	6.7	7.4	7.2	7.1	7.4	7.1	6.7	7.4
	23.3%	7.2	7.1	7.3	7.3	7.2	7.4	7.4	7.3	6.7	7.1	7.0	7.1	7.1	7.1	7.2	6.8	7.4	7.4	7.3	7.4	7.1	6.8	7.4
	46.5%	7.4	7.3	6.9	7.4	7.1	7.4	7.4	7.4	6.8	7.3	7.1	7.3	7.1	7.1	7.2	6.8	7.6	7.9	7.4	8.6	7.2	6.8	7.5
	9.3%	8.3	7.4	7.0	8.0	7.3	7.6	7.5	7.8	6.8	8.6	7.1	7.7	7.2	7.5	7.7	6.5	8.9	8.1	7.5	8.9	7.3	6.5	7.6
TEMP.	CONTROL	24.6	25.3	25.7	25.4	25.5	25.4	25.3	25.0	25.0	25.3	25.3	25.1	25.3	25.6	25.3	24.6	25.7	25.2	24.6	25.4	25.4	25.0	25.7
	11.6%	24.8	25.3	25.7	25.4	25.5	25.4	25.2	25.2	25.2	25.3	25.2	25.1	25.2	25.5	25.3	24.8	25.7	25.2	24.8	25.4	25.3	25.0	25.7
	23.3%	24.7	25.3	25.5	25.5	25.2	25.5	25.1	25.4	25.0	25.3	25.1	25.1	25.1	25.4	25.2	24.7	25.5	25.3	24.7	25.5	25.2	25.0	25.5
	46.5%	24.6	25.3	25.6	25.6	25.4	25.3	25.1	25.4	24.8	25.3	25.2	25.0	25.1	25.3	25.2	24.6	25.6	25.2	24.6	25.6	25.2	24.8	25.6
	9.3%	24.4	25.4	25.6	25.7	25.4	25.8	25.1	25.2	25.0	25.3	25.0	24.8	24.9	25.1	25.2	24.4	25.8	25.3	24.4	25.8	25.2	24.9	25.6
COND.	CONTROL	305	267	270	274	276	276	280	278	267	305	305	274											
	11.6%	328	329	316	335	326	319	324	325	316	335	335	316											
	23.3%	381	381	368	394	365	363	363	374	363	394	394	363											
	46.5%	488	493	468	528	485	445	458	476	445	528	528	445											
	9.3%	488	707	651	772	600	614	628	637	488	772	772	637											
ALK.	CONTROL	64	64	64	64	64	64	64	64	64	64	64	64											
	11.6%																							
	23.3%																							
	46.5%																							
	9.3%																							
HAND.	CONTROL	98	98	98	98	98	98	98	98	98	98	98	98											
	11.6%																							
	23.3%																							
	46.5%																							
	9.3%																							
COND.	CONTROL	158	158	120	120	158	158	158	147	120	158	158												
	11.6%																							
	23.3%																							
	46.5%																							
	9.3%																							
ALK.	CONTROL	64	64	64	64	64	64	64	64	64	64	64	64											
	11.6%																							
	23.3%																							
	46.5%																							
	9.3%																							
HAND.	CONTROL	98	98	98	98	98	98	98	98	98	98	98	98											
	11.6%																							
	23.3%																							
	46.5%																							
	9.3%																							

Client Name: NorthsideDate: 7-13-04

DATA FOR CERIODAPHNIA 7 DAY TEST

REPLICATE

EFF. CONC	DAY NO.	1	2	3	4	5	6	7	8	9	10	TOTAL LIVE YOUNG	NO. LIVE ADULTS
Ctrl	W ₁	L									→	0	10
	W ₂	L									→	0	10
	W ₃	L									→	0	10
	W ₄	7	6	4	6	8	6	10	L	4	6	47	9
	W ₅	L	10	8	L	11	L		10	L	9	48	9
	W ₆	L	8	12	13	12	14		13	14	L	88	9
	W ₇	7	12/14	L	9	L	10		11	13	15	105	9
	Totals	14	24	24	28	31	32	10	34	31	30	248	9
11.6% (23.2ml)	1	L									→	0	10
	2	L									→	0	10
	3	L									→	0	10
	4	6	5	7	7	6	5	6	6	3	5	56	10
	5	10	8	L	L	10	L	L	10	L	8	46	10
	6	L	15	14	14	9	10	11	13	14	11	113	10
	7	14	6	12	13	15	7	12	L	13	L	92	10
	Totals	80	34	35	34	40	22	29	29	30	24	307	10
23.2% (46.4ml)	1	L									→	0	10
	2	L									→	0	10
	3	L									→	0	10
	4	6	L	6	6	7	7	6	4	4	7	53	10
	5	14	10	13	11	8	9	7	8	11	L	91	10
	6	12	13	L	10	L	13	14	10	7	10	97	10
	7	L	L	17	3	6	10	11	13	L	14	74	10
	Totals	32	23	30	30	21	39	38	35	24	37	315	10
46.5% (93ml)	1	L									→	0	10
	2	L									→	0	10
	3	L									→	0	10
	4	5	3	6	3	7	6	7	6	6	5	54	10
	5	L	L	L	10	11	12	7	11	10	6	57	9
	6	14	10	11	12	15	L	10	12		11	93	9
	7	10	12	14	8	11	9	7	8	✓	L	79	9
	Totals	29	25	31	33	42	27	31	37	6	22	283	9

Elab Log# 0404072A, 0407074A, 0407122A

EAC'd hmr

90

% Survival

24.8

Mean Reproduction

8

of Third Broods

Client Name: NorthsideDate: 7-13-04

DATA FOR CERIODAPHNIA 7 DAY TEST

REPLICATE

EFF. CONC.	DAY NO.	1	2	3	4	5	6	7	8	9	10	TOTAL LIVE YOUNG	NO. LIVE ADULTS
93% (186 ml)	SW ₁	L									→	0	10
	SW ₂	L									→	0	10
	SW ₃	L									→	0	10
	T ₁	9	4	6	11	6	3	7	2	4	4	52	10
	SW ₅	9	10	11	L	8	2	L	9	5	10	62	10
	SW ₆	8	13	10	12	10	12	90	13	6	7	100	9
	SW ₇	L	L	9	5	6	11	↓	5	4	10	52	9
	Totals	26	23	36	28	30	26	16	29	21	31	266	9
	1	L									→	0	10
	2	L									→	0	10
100%	3	L									→	0	10
	4	2	5	6	5	7	L	8	10	L	7	50	10
	5	9	11	7	10	8	L	L	5	5	6	61	10
	6	8	7	3	7	5	7	9	11	6	5	70	10
	7	5	9	L	8	7	9	L	10	L	L	48	10
	Totals	24	32	16	32	27	16	17	36	11	18	229	10
	1												
	2												
	3												
	4												
	5												
	6												
	7												
	Totals												
	1												
	2												
	3												
	4												
	5												
	6												
	7												
	Totals												

0404072A, 0407094A, 040722A

Oxid. H₂O₂

% Survival

Mean Reproduction

of Third Broods

APPENDIX D
STATISTICAL ANALYSIS

Northside7/04-7 Day Survival

Start Date: 7/13/04 11:00 Test ID: NsCd704c Sample ID: XX9999999-NPDES Permit #
 End Date: 7/20/04 11:10 Lab ID: ELAB Sample Type: EFF1-POTW
 Sample Date: Protocol: EPAF 94-EPA Freshwater Test Species: CD-Ceriodaphnia dubia
 Comments:

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
11.6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
23.3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
46.5	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000
93	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Rank Sum	1-Tailed Critical	Isotonic	
			Mean	Min	Max	CV%	N			Mean	N-Mean
D-Control	0.9900	1.0000	1.3957	1.2490	1.4120	3.692	10			0.9967	1.0000
11.6	1.0000	1.0101	1.4120	1.4120	1.4120	0.000	10	110.00	75.00	0.9967	1.0000
23.3	1.0000	1.0101	1.4120	1.4120	1.4120	0.000	10	110.00	75.00	0.9967	1.0000
46.5	0.9900	1.0000	1.3957	1.2490	1.4120	3.692	10	105.00	75.00	0.9933	0.9967
93	0.9900	1.0000	1.3957	1.2490	1.4120	3.692	10	105.00	75.00	0.9933	0.9967
100	1.0000	1.0101	1.4120	1.4120	1.4120	0.000	10	110.00	75.00	0.9933	0.9967

Auxiliary Tests

Kolmogorov D Test indicates non-normal distribution ($p \leq 0.01$) 3.53057 1.035 -3.8686 14.5011

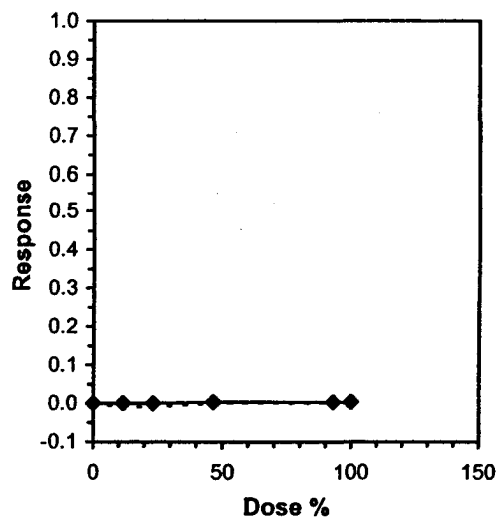
Equality of variance cannot be confirmed

Hypothesis Test (1-tail, 0.05) NOEC LOEC ChV TU

Steel's Many-One Rank Test 100 >100 1

Linear Interpolation (200 Resamples)

Point % SD 95% CL Skew
 IC25 >100



Northside7/04-Reproduction

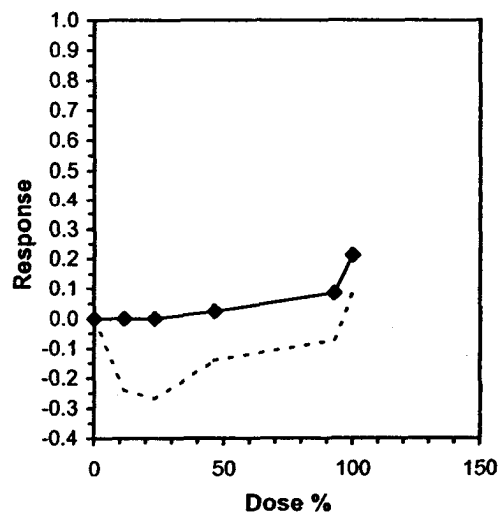
Start Date: 7/13/04 11:00 Test ID: NsCd704c Sample ID: XX9999999-NPDES Permit #
 End Date: 7/20/04 11:10 Lab ID: ELAB Sample Type: EFF1-POTW
 Sample Date: Protocol: EPAF 94-EPA Freshwater Test Species: CD-Ceriodaphnia dubia
 Comments:

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	14.000	24.000	24.000	28.000	31.000	32.000	0.000	34.000	31.000	30.000
11.6	30.000	34.000	35.000	34.000	40.000	22.000	29.000	29.000	30.000	24.000
23.3	32.000	23.000	36.000	30.000	21.000	39.000	38.000	35.000	24.000	37.000
46.5	29.000	25.000	31.000	33.000	42.000	27.000	31.000	37.000	6.000	22.000
93	26.000	23.000	36.000	28.000	30.000	26.000	16.000	29.000	21.000	31.000
100	24.000	32.000	16.000	32.000	27.000	16.000	17.000	36.000	11.000	18.000

Conc-%	Mean	N-Mean	Transform: Untransformed					t-Stat	1-Tailed		Isotonic	
			Mean	Min	Max	CV%	N		Critical	MSD	Mean	N-Mean
D-Control	24.800	1.0000	24.800	0.000	34.000	42.154	10				29.000	1.0000
11.6	30.700	1.2379	30.700	22.000	40.000	17.308	10	-1.656	2.287	8.145	29.000	1.0000
23.3	31.500	1.2702	31.500	21.000	39.000	21.230	10	-1.881	2.287	8.145	29.000	1.0000
46.5	28.300	1.1411	28.300	6.000	42.000	34.342	10	-0.983	2.287	8.145	28.300	0.9759
93	26.600	1.0726	26.600	16.000	36.000	21.133	10	-0.505	2.287	8.145	26.600	0.9172
100	22.900	0.9234	22.900	11.000	36.000	37.136	10	0.533	2.287	8.145	22.900	0.7897

Auxiliary Tests					Statistic	Critical	Skew	Kurt			
Kolmogorov D Test indicates normal distribution (p > 0.01)					0.87658	1.035	-0.9199	1.46564			
Bartlett's Test indicates equal variances (p = 0.24)					6.75426	15.0863					
Hypothesis Test (1-tail, 0.05)		NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test		100	>100		1	8.14497	0.32843	112.267	63.437	0.13472	5, 54

Linear Interpolation (200 Resamples)				
Point	%	SD	95% CL	Skew
IC25	>100			

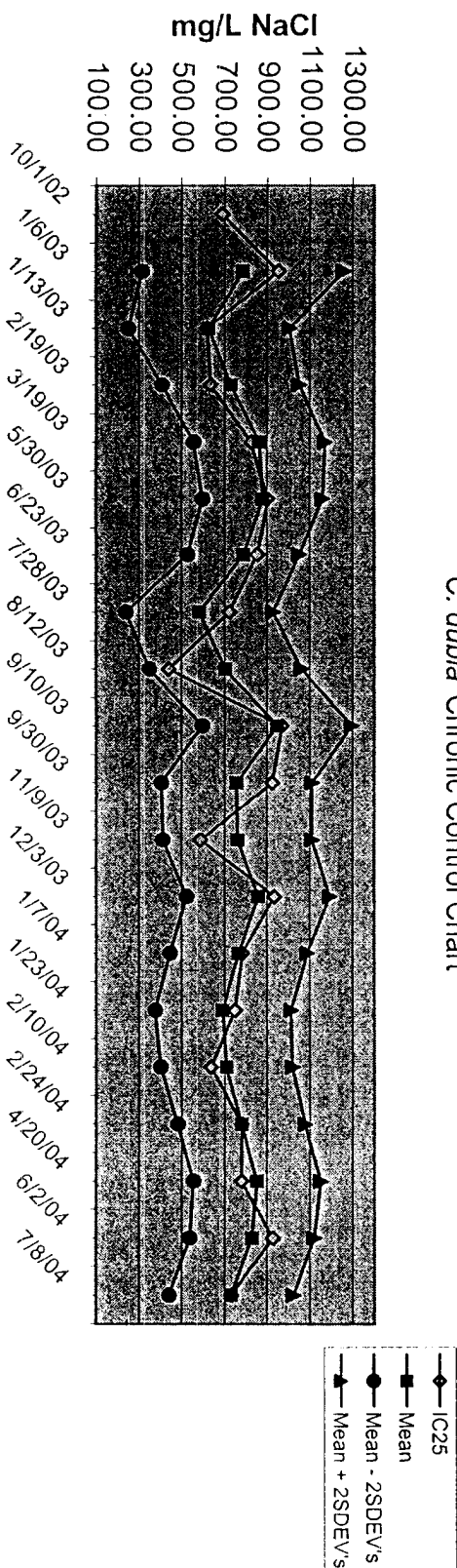


APPENDIX E
REFERENCE TOXICANT DATA

Updated July 8, 2004
 IC25 NaCl Reference Toxicant Tests
 Control Chart for *C. dubia*

Source	Date	IC25	Mean	Standard Deviation	2STDEV's	Mean - 2SDEV's	Mean + 2SDEV's	CV%
ELAB of TN	10/1/02	691.11	786.46	235.71	471.41	315.05	1257.87	29.97
ELAB of TN	1/6/03	953.13	786.46	188.29	376.58	250.68	1003.84	30.02
ELAB of TN	1/13/03	619.79	627.26	159.88	319.77	409.44	1048.98	21.93
ELAB of TN	2/19/03	634.73	729.21	153.05	306.10	557.57	1169.76	17.72
ELAB of TN	3/19/03	823.69	863.67	139.55	279.09	599.41	1157.60	15.88
ELAB of TN	5/30/03	903.64	878.51	130.46	260.92	527.57	1049.41	16.55
ELAB of TN	6/23/03	853.37	788.49	171.90	343.81	238.72	926.33	29.51
ELAB of TN	7/28/03	723.61	582.53	177.26	354.52	350.17	1059.22	25.15
ELAB of TN	8/12/03	441.44	704.70	174.18	348.36	597.73	1294.46	18.41
ELAB of TN	9/10/03	967.95	946.10	175.40	350.80	406.06	1107.65	23.17
ELAB of TN	9/30/03	924.24	756.86	173.96	347.91	413.17	1108.99	22.86
ELAB of TN	11/9/03	589.47	761.08	166.55	333.10	525.04	1191.25	19.41
ELAB of TN	12/3/03	932.69	858.15	160.24	320.48	446.06	1087.01	20.90
ELAB of TN	1/7/04	783.60	766.54	158.61	317.22	376.59	1011.04	22.86
ELAB of TN	1/23/04	749.47	693.82	153.26	306.53	403.30	1016.35	21.59
ELAB of TN	2/10/04	638.16	709.83	148.41	296.82	483.13	1076.77	19.03
ELAB of TN	2/24/04	781.49	779.95	148.56	297.13	555.02	1149.27	17.43
ELAB of TN	4/20/04	778.41	852.15	144.79	289.58	539.17	1118.33	17.47
ELAB of TN	6/2/04	925.88	828.75	144.79	289.58	442.04	1021.20	19.79
ELAB of TN	7/8/04	731.62	731.62	144.79	289.58	442.04	1021.20	19.79

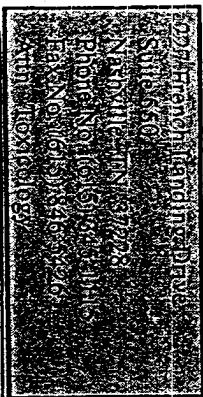
C. dubia Chronic Control Chart



APPENDIX F
CHAIN OF CUSTODY FORMS

AQUATIC TOXICOLOGY CHAIN OF CUSTODY RECORD

ELAB OF TENNESSEE, LLC



Send Invoice To:

Name Jenny H Moss
 Company ACEA
 Address 2806 628
 County Christian
 City & State Poplarville, MS
 Phone 228-887-4147

Send Results To:

Name Jenny H Moss
 Company ACEA
 Address 2806 628
 County Christian
 City & State Poplarville, MS
 Phone 228-887-4147

Page 1 of 1
 Cooler No. 1
 Date Shipped 7-12-09

P.O. #

Project No.

Project Name

Samplers (Signature)

Printed Name (Start/Finish)

Sample No.

Date Sampled (start/finish)

Time Sampled (start/finish)

Composite

Grab Collected

Sample Location/Description

No. of Containers

TEST TYPE

ORGANISM(S)

Chronic Screen

Chronic Definitive

Acute Screen

Acute Definitive

T.I.E./T.R.E.

Water Effects Ratio

Pimephales promelas

Daphnia dubia

Daphnia magna

Daphnia pulex

Mysidopsis bahia

Non-Renewal

Renewal

Other Analysis

Pb, Cu, Zn

Observations:

Order: NO

Temperature at Arrival: 21°C

Sample 1 of 3

Relinquished by: [Signature]

Date / Time: 7/12/09

Received by: [Signature]

Date / Time: 7/12/09

Received for Laboratory by: [Signature]

Date / Time: 7/12/09

Remarks: Initial, Clean / Signal 0.15

Method of Shipment:

Shipping Number:

NPDES Number:

Pipe / Outfall Number:

DISTRIBUTION: Original and yellow copies accompany sample shipment to laboratory;

Yellow copy retained by laboratory; Pink copy retained by samplers.

Rev. 5/96

0000030

ELAB OF TENNESSEE, LLC

Send Invoice To:

Name Texas IX-Moss

Company John EA

7080 6.28

County Cherokee

CLIV & State Chas Kinsville H

Phone 270-887-4147

P.O. # _____

Send Results To:

Name Henry J. 11/255

Company Yan Yan

Address 26. 28

CITY & STATE Rockville, Md

Phone 270-887-4147

TEST TYPE	O
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Page 1 of 1

Cooler No. 1 of 1

Date Shipped 7-24-01

5522 Henschel Landing Drive
Suite 450
Nashville, TN 37222
Phone No. (615) 845-4115
Fax No. (615) 845-4766
Auto Histology

Send Invoice To:
Name TENNESSEE
Company USA
Address PO BOX 628
County CHRISTIAN
City & State KNOXVILLE TN
Phone 220-882-4147
P.O. # _____

Send Results To:

Name Erny H. Moss

Company Yul EA

Address 2616 28

City & State Knoxville, TN

Phone 270-887-4147

Page 17 of 17
Cooler No. 01
Date Shipped 7-18-03

Project No.		Project Name																			
Samplers (Signature)		Printed Name (Start/Finish)																			
Sample No.	Date Sampled (start/finish)	Time Sampled (start/finish)	Composite	Grab Collected	Chilled	Sample Location/Description	No. of Containers	Chronic Screen	Chronic Definitive	Acute Screen	Acute Definitive	T. I. E. / T. R. E.	Water Effects Ratio	Pimephales promelas	Ceriodaphnia dubia	Daphnia magna	Daphnia pulex	Mysidopsis bahia	Non-Renewal	Renewal	Other Analysis
Example	001	00/00/00	00:00	X	X	Final Effluent	2	X					X	X					X	Pb, Cu, Zn	
0403094		07/13/04	7:00	X	X	Northeast of Fin...	1														
Observations: Intact, clear, w/ sup. solids							Odor: none Temperature at Arrival: 20°C Sample # of 3														

DISTRIBUTION: Original and yellow copies accompany sample shipment to laboratory; Yellow copy retained by laboratory; Pink copy retained by samplers.

Hopkinsville Water Environment Authority

401 East 9th Street • P.O. Box 628 • Hopkinsville, Kentucky 42241-0628

Len F. Hale
General Manager



Phone (270) 887-4246
Fax (270) 887-4244

September 22, 2004

**Ms. Sue Davis
Division of Water
KPDES Branch
Frankfort Office Park
14 Reilly Road
Frankfort, Kentucky 40601**

**Subject: KPDES No.: KY0023388
Hopkinsville Northside Wastewater Treatment Plant
Christian County, Kentucky
Permit Renewal Application**

Ms. Davis,

Please find enclosed one (1) copy of the subject application. If you have any questions, please contact Jenny Moss, Environmental Compliance Coordinator, at (270) 887-4147.

Sincerely,

A handwritten signature in black ink, appearing to read "Len Hale", is written over the word "Sincerely,".

**Len Hale
General Manager**

Enclosure – Permit Application – Northside WWTP

